IEEE P802.11
Wireless LANs

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| Proposed Resolution Text for CID 7139 |
| Date: 2015-1-13 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Santosh Abraham | Qualcomm Inc. | 5775 Morehouse Drive, San Diego, CA 92121 |  | sabraham@qti.qualcomm.com |
|  |  |  |  |  |

Abstract

This document presents resolutions to CID XXXX

The fields in the FILS discovery frame are updated to allow a scanning STA to compute the next beacon transmission time. The changes are shown based on text from TGai Draft 4.0 Clause 8.6.8.36. In addition a change for Clause 10.45.2.2 is also indicated.

* Action frame format details
* Public Action details
* Public Action frames

***Insert new row into table as follows, making appropriate adjustment to value of “Reserved”***

|  |
| --- |
| * Public Action field values
 |
| Public Action field value | Description |
| 34 | FILS Discovery |

***Insert the new clause as follows:***

* FILS Discovery frame format

The FILS Discovery frame uses Public Action frame format. The format of its Action field is shown in Table 8-309a (FILS Discovery frame format).

|  |
| --- |
| * FILS Discovery frame format
 |
| Order | Information | Notes |
| 1 | Category [14/1107r3] |  |
| 2 | Public Action [14/1107r3] |  |
| 3 | FILS Discovery Information field  | [CID 4617] |
| 4 | Reduced Neighbor Report element [CID 5133]  | Reduced Neighbor Report element is optionally present. |
| 5 | FILS Indication element | The FILS Indication element is optionally present.  |
| 6 | Vendor Specific element | One or more Vendor Specific elements are optionally present. |

[14/1107r3] [CID 6333]

The Category field indicates the public category specified in Table 8-54 (Category values). [14/0412r3][CID 4887][15/0021r3]

The Public Action field indicates the value of the FILS Discovery frame, as specified in Table 8-293 (Public Action field values) in  8.6.8.1 (Public Action frames). [14/0412r3][15/0021r3]

The FILS Discovery Information field is shown in Figure 8-663a (FILS Discovery Information field format).

***Update from Draft 4.0: Change Figure 8.633a as shown below***

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |
| [14/1107r3][15/0021r3][CID 6596]  | FILS Discovery Frame Control | Timestamp | Beacon Interval | SSID/Short SSID | ~~AP’s Next TBTT Offset~~ | Length | FD Capability | Operating Class |
| Octets: | 2 | 8 | 2 | 1-32 | ~~1~~ | ~~0 or 2~~ | 0 or 2 | 0 or 1 |
|  |  |  |  |  |  |  |  |  |
| [CIDs 4031, 4055, 4616, 4250][CID 4161][CID 6384] [CIDs 6593, 6161, 6160, 6097, 6160]  | AP Configuration Sequence Number | Access Network Options | Primary Channel | FD RSN Information  | Channel Center Frequency Segment 1 |
| Octets: | 0 or 1 | 0 or 1 | 0 or 1 | 0 or 5 | 0 or 1 |  |  |  |
|  |  | * FILS Discovery Information field format [14/0412r3][CIDs 4804, 4617
 |

 [14/0412r3]

[14/0412r3][CID 4887][14/0412r3]The format of the FILS Discovery Frame Control subfield is shown in  8-663b (FILS Discovery Frame Control subfield format).

***Update from Draft 4.0: Change Figure 8.633b as shown below***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | B0 B4 | B5 | B6 | B7 |
| [15/0021r3] |  SSID Length[CID 6570]  | CapabilityPresenceIndicator | Short SSID Indicator | AP-CSNPresenceIndicator |
| Bits: | 5 |  | 1 | 1 | 1 |
|  |  |  |  |  |  |  |  |
| [CID 4585] | B8 | B9 | B10 | B11[13/1043r1] | ~~B12~~ | B12 B16 |  |
| [CID 6596] | ANOPresenceIndicator | CCFS-1 Presence Indicator [13/1534r0] | Primary Channel Presence Indicator | RSN Info Presence Indicator | Length Presence Indicator[CID 6773]  | Reserved |  |
| Bits: | 1 | 1 | 1 | 1 | ~~1~~ | 4 |  |
| * FILS Discovery Frame Control subfield format
 |

The SSID Length subfield of the FILS Discovery Frame Control subfield indicates the length, in octets, of the SSID/Short SSID subfield in the FILS Discovery frame. The value of this subfield is equal to the length of the SSID/Short SSID subfield in octets minus 1.When the Short SSID Indicator subfield is equal to 1, the value of the SSID Length subfield is equal to 3 (the length of the Short SSID in octets minus 1).[13/1339r1][CID 4162, 4163, 4164][15/0021r3]

A value of 1 for the Capability Presence Indicator subfield indicates that the FD Capability subfield is present in the FILS Discovery frame. A value of 0 indicates that the FD capability subfield is not present in the FILS Discovery frame. [13/1339r1][14/0412r3][CIDs 4056, 4641, 4166, 4165, 4645, 4648, 4646, 4651, 4647, 4644, 4650, 4649] [14/1107r3]

A value of 1 for the Short SSID Indicator subfield indicates that a Short SSID is contained in the SSID/Short SSID field of the FILS Discovery frame. A value of 0 indicates that a SSID is contained in the SSID/Short SSID field of the FILS Discovery frame. [15/0021r3]

[13/1339r1][14/0412r3][CID 4033, 4064, 4252, 4643][14/1107r3][15/0021r3]A value of 1 for the AP-CSN Presence Indicator subfield indicates that the AP-CSN subfield is present in the FILS Discovery frame. A value of 0 indicates that the AP-CSN subfield is not present in the FILS Discovery frame. [13/1339r1][14/0412r3][14/1107r3]

A value of 1 for the ANO Presence Indicator subfield indicates that the ANO subfield is present in the FILS Discovery frame. A value of 0 indicates that the ANO subfield is not present in the FILS Discovery frame. [13/1339r1][14/0412r3][14/1107r3]

A value of 1 for the CCFS-1 (channel center frequency segment 1) Presence Indicator subfield indicates that the Channel Center Frequency Segment 1 subfield is present in the FILS Discovery frame. A value of 0 indicates that Channel Center Frequency Segment 1 is not present. [13/1534r0][14/0412r3][CID 4167][14/1107r3]

A value of 1 for the Primary Channel Presence Indicator subfield indicates that the Primary Channel and the Operating Class subfields are present in the FILS Discovery frame. A value of 0 indicates that the Primary Channel and the Operating Class subfields are not present in the FILS Discovery frame.[14/1107r3][13/1339r1][14/0412r3][15/0021r3]

A value of 1 for the FD RSN Information Presence Indicator subfield indicates that the FD RSN information subfield is present in the FILS Discovery frame. A value of 0 indicates that the FD RSN information subfield is not present in the FILS Discovery frame.

A value of 1 for the Length Presence Indicator subfield indicates that the Length field is present in the FILS Discovery frame. A value of 0 indicates that the Length field is not present in the FILS Discovery frame. [CID 6596]

[Motion 122] [Motion 122][15/0021r3]The SSID/Short SSID subfield is variable length between 1 and 32 octets.When the value of the Short SSID Indicator subfield is equal to 1, the SSID/Short SSID field contains the 4-byte Short SSID (see  8.4.2.169 (Reduced Neighbor Report element)). Otherwise, the SSID/Short SSID field contains the SSID, of which the length is specified by the 5-bit SSID Length subfield in the FILS Discovery Frame Control of the FILS Discovery frame (see 8.4.2.2 (SSID element)).[14/0412r3][CID 6571]

***Update from Draft 4.0: Delete the lines indicated and add the underlined lines***

~~The AP's Next TBTT Offset (ANTO) field indicates the time offset in number of TUs, rounded down to the closest TU, between the transmission of the FILS Discovery frame and the next TBTT of a targeted AP.~~

The time stamp field carries the value of the TSF timer at the frame source.

The Beacon Interval field carries the beacon interval in Tus.

The Length field is 1 octet in length and indicates the length of the remaining fields in the FILS Discovery Information field in octets. Its value is variable. [CID 6596]

The FD Capability subfield contains the information that advertises the capabilities and operational indications of the STA transmitting the FILS Discovery frame. Its presence is indicated by the Capability Presence Indicator subfield in the FILS Discovery Frame Control being equal to 1. The format of the FD Capability subfield is shown in Figure 8-663c (FD Capability subfield format).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | B0 | B1 | B2 B4 | B5 B7 |
| [14/1270r0] | ESS | Privacy | BSS Operating Channel Width [14/0834r3]  | Maximum Number of Spatial Streams [CID 4889] |
| Bits: | 1 | 1 |  | 3 | 3 |
|  |  |  |  |  |  |  |  |  |
|  | B8 | B9 | B10 B12 | B13 B15 |
|  | Reserved | Multiple BSSIDs Presence Indicator | PHY Index[14/0834r3]  | FILS Minimum Rate  |
| Bits: | 1 | 1 | 3 | 3 |
| * FD Capability subfield format [CID 4618]
 |

 [14/0412r3][CIDs 6780, 6571]

The subfields ESS and Privacy are interpreted as specified in 8.4.1.4 (Capability Information field). [13/1339r1]

[14/1270r0][Motion #136]The BSS Operating Channel Width subfield indicates the BSS operating channel width as defined in Table 8-309b (BSS Operating Channel Width).

|  |
| --- |
| * BSS Operating Channel Width [14/0834r3]
 |
| BSS Operating Channel Width field [CIDs 6016, 6475, 6774]  | HR/DSSS, OFDM, ERP, HT, or VHT BSS operating channel width | TVHT BSS operating channel width [15/0021r3] |
| 0 | 20 MHz or 22 MHz | TVHT\_W |
| 1 | 40 MHz | TVHT\_W+W |
| 2 | 80 MHz | TVHT\_2W |
| 3 | 160 MHz or 80+80 MHz | TVHT\_4W or TVHT\_2W+2W |
| 4- 7 [CID 6588]  | Reserved |  |

 [14/0834r3][14/1270r0][CIDs 6586, 6016]

NOTE—FILS is only supported in non-DMG infrastructure BSS. FILS is not supported in IBSS, PBSS, or MBSS. [CIDs 4881, 4006][CID 6294]

The Maximum Number of Spatial Streams subfield is coded per Table 8-309c (Maximum Number of Spatial Streams).

|  |
| --- |
| * Maximum Number of Spatial Streams [14/0834r3]
 |
| Number of Spatial Streams subfield[CID 6474]  | Maximum Number of Spatial Streams |
| 0 | 1 |
| 1 | 2 |
| 2 | 3 |
| 3 | 4 |
| 4 | 5 to 8 |
| 5 - 7  | Reserved |

 [CID 4889] [14/0834r3]

The Multiple BSSIDs Presence Indicator subfield is set to 1 to indicate that the Multiple BSSID element is present in the Beacon frame. It is set to 0 to indicate that the Multiple BSSID element is not present in the Beacon frames.

The PHY Index subfield is defined as in Table 8-309d (PHY Index subfield).

|  |
| --- |
| * PHY Index subfield [14/0834r3]
 |
|  PHY Index subfield [CID 6776]  |  PHY Index [14/0834r3] |
| 0 | HR/DSSS (See Clause 17 (High rate direct sequence spread spectrum (HR/DSSS) PHY specification)) |
| 1 | ERP-OFDM (See Clause 18 (Orthogonal frequency division multiplexing (OFDM) PHY specification) and 19 (Extended Rate PHY (ERP) specification))  |
| 2 | HT (See Clause 20 (High Throughput (HT) PHY specification)) |
| 3 | VHT (See Clause 22 (Very High Throughput (VHT) PHY specification)Or TVHT (See Clause 23 (Television Very High Throughput (TVHT) PHY specification))) [CID 4027][15/0021r3]  |
| 4 - 7 | Reserved |

 [14/0834r3] [CIDs 6157, 6917, 6590, 6767 multiple places]

The FILS Minimum Rate subfield indicates the minimum rate to be used by the AP transmitting the FILS Discovery frame and by FILS STAs in subsequent transmissions between the AP and FILS STAs. [14/1107r3]Depending on the PHY Type subfield of the received FILS Discovery frame, the minimum rate is represented as a bit rate value or as an MCS value as shown in Table 8-309e (FILS Minimum Rate). If an MCS value is provided, then the minimum rate can be derived from the MCS value and the PHY Type in the FD Capability subfield.

|  |
| --- |
| * FILS Minimum Rate
 |
| FILS Minimum Rate subfield[CIDs 6768, 6769]  | PHY Type subfield is 0 (HR/DSSS)[14/0834r3][CID 6158]  |  PHY Type subfield is 1 (ERP-OFDM) |  PHY Type subfield is 2 (HT) |  PHY Type subfield is 3 (VHT or TVHT)[15/0021r3] |
| 0 | 1 Mbps | 6 Mbps | MCS 0 [CID 4888]  | MCS 0 |
| 1 | 2 Mbps | 9 Mbps | MCS 1 | MCS 1 |
| 2 | 5.5 Mbps | 12 Mbps | MCS 2 | MCS 2 |
| 3 | 11 Mbps | 18 Mbps | MCS 3 | MCS 3 |
| 4 | Reserved | 24 Mbps | MCS 4 | MCS 4 |
| 5 - 7 | Reserved | Reserved | Reserved | Reserved |

 [14/0834r3] [CIDs 6155, 6770, 6771], 6772

[14/0412r3][CID 4621]The Operating Class field is 1 octet in length. It specifies the operating class of the Primary Channel of the transmitting AP (see 8.4.1.36 (Operating Class)).The Operating Class field is 1 octet in length. It specifies the operating class of the Primary Channel of the transmitting AP (see 8.4.1.36 (Operating Class)).[15/0021r3]The Operating Class field is 1 octet in length. It specifies the operating class of the Primary Channel of the transmitting AP (see 8.4.1.36 (Operating Class)). [15/0021r3]

AP Configuration Sequence Number (AP-CSN) subfield format is defined in  8.4.2.178 (AP Configuration Sequence Number element). [14/0412r3][CIDs 4622, 4623, 4624 multiple places, , 4628, 4627, 4626, 4625]

Access Network Options (ANO) subfield format is specified in Figure 8-436 (Access Network Options field format) in 8.4.2.91 (Interworking element). [14/0412r3][CIDs 4026, 4624, , 4628, 4627, 4626, 4625]

Primary Channel subfield is set to the channel number of the primary channel (See 10.16.2 (Basic 20/40 MHz BSS functionality)) if the FILS Discovery frame is transmitted as a non-HT duplicate PPDU, otherwise the subfield is not present. [14/0412r3][CID 6159]

Channel Center Frequency Segment 1 subfield is set to the index of the channel center frequency of the frequency segment 1 for an 80+80 MHz VHT BSS, if the FILS Discovery frame is transmitted as a non-HT duplicate PPDUs at an 80+80 MHz channel bandwidth; otherwise the subfield is not present. [14/0412r3][CID 6159] [15/0021r3]

[14/0412r3][CIDs 4629, 4628, 4627, 4626, 4625]The FD RSN Information subfield contains the RSN information, including: RSN capability, an authentication suite selector, a pairwise cipher suite selector, a group data cipher suite selector, and a group management cipher suite selector. Its format is defined in Figure 8-663d (Format of the FD RSN Information subfield).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| [CID 4426][CID 6596]  | B0 B15 | B16 B21 | B22 B27 | B28 B33 | B34 B39 |
|  | RSN Capability | Group Data Cipher Suite Selector | Group Mgmt Cipher Suite Selector | Pairwise Cipher Suite Selector | AKM Suite Selector |
| Bits: | 16 | 6 | 6 | 6 | 6 |
| * Format of the FD RSN Information subfield [13/1043r1]
 |

 [13/1043r1][CID 6246]

The FD RSN information subfield contains a RSN Capability subfield, as specified in Figure 8-217 (RSN Capabilities field format) in 8.4.2.24.4 (RSN capabilities).[13/1043r1] [CID 6264]

The FD RSN information subfield also contains three Cipher Suite Selectors, including one Group Data Cipher Suite selector, one Group Management Cipher Suite selector, and one Pairwise Cipher Suite Selector. Each Cipher Suite selector is a code identifying a Cipher Suite Type as specified in Table 8-138 (Cipher suite selectors). The definition of the Cipher Suite Selectors is shown in Table 8-309f (Cipher Suite Selector Definitions). [13/1043r1]

|  |
| --- |
| * Cipher Suite Selector Definitions [13/1043r1]
 |
| Cipher Suite Selector  | Cipher Suite Type |
| 0 - 13 [CID 4885][CID 6596]  | Cipher Suite Type 0 to 13, in Table 8-138 (Cipher suite selectors) [CID 6595]  |
| 14 - 61 | Reserved |
| 62 | Vendor Specific |
| 63 | No cipher suite selected [CID 4884]  |

[CID 6597]

The RSN Information subfield contains one AKM Suite Selector. A Cipher Suite selector is a code identifying a AKM Suite Type as specified in Table 8-113 (AKM suite selectors). The definition of the AKM Suite Selectors is shown in Table 8-309g (AKM Suite Selector Definitions).

|  |
| --- |
| * AKM Suite Selector Definitions [13/1043r1]
 |
| AKM Suite Selector  | AKM Suite Type |
| 0[p14/1186r5 Motion #120] | Use AKM from RSN IE Beacon/Probe Response |
| 1[p14/1186r5 Motion #120] | Set AKM Suite to 14 of Table 8-140 (AKM suite selectors) |
| 2[p14/1186r5 Motion #120] | Set AKM Suite to 15 of Table 8-140 (AKM suite selectors) |
| 3[p14/1186r5 Motion #120] | Set AKM Suite to either 14 or 15 of Table 8-140 (AKM suite selectors) |
| 4 - 13[p14/1186r5 Motion #120] | Reserved |
| 14 | Vendor Specific |
| 15 | no AKM suite selected |

 [13/1043r1]

***Insert new clause as follows:***

* FILS Action frame details [CID 6224]

The FILS Action frame is used for FILS operation after the non-AP STA has associated with the AP. A FILS Action field, in the octet immediately after the Category field, differentiates the FILS Action frame formats. The defined FILS Action frames are listed in Table 8-406a (FILS Action frame values).

|  |
| --- |
| * FILS Action frame values [CID 6225]
 |
| Action field value | Description |
| 0 | FILS Container frame [13/1358r3][CID 4882] |
| 1-255 | Reserved |

**10.45.2.2 FILS Discovery frame reception**

***Add the following to end of clause 10.45.2.***

A scanning FILS STA that receives a FILS discovery frame can compute the next TBTT based on the time stamp and beacon interval as follows:

 Next TBTT = ceiling(Time Stamp/(Beacon Interval \* 1024)) \* (Beacon Interval \* 1024).